



RACE FOR SURVIVAL

GRADE LEVEL: 1-8

TIME REQUIRED: One class session

SETTING: Classroom or outdoors

GOAL: Given an environmental change the student will select a possible adaptation for survival.

OUTCOMES: At the end of this lesson the student will:

- define adaptation,
- define natural selection, and
- verbalize how life forms adapt.

KERA GOALS: Meets KERA goals 1.2, 1.3, 1.4, 1.5, 1.7, 1.10, 2.1, 2.2, 2.3, 2.4, 2.6, 2.11, 3.4, 3.7, 4.2, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5, 6.3

BACKGROUND INFORMATION

Our planet contains a great variety of distinct ecosystems: desert, pond, mountain top, forest, ocean, or cave, to name but a few. Within each of these environments lives a selection of plants and animals that have adapted to each other and to their surroundings. This has occurred by the development of a specific set of physical or sensual modifications that helps these plants and animals survive.

The ecosystems in which organisms live are dynamic and ever changing. Fire, flood, drought, earthquakes, or changes in the climate may alter these environments. A new organism may be introduced into the environment that alters the inter-relationship of the original inhabitants. As the environmental system changes, organisms are forced to change and adapt in order to survive.

When change occurs in the environment, individual characteristics of a species may help or hinder the survival of that population. If the characteristic helps, the species survives the changing situation and passes on the genes that give those characteristics to their offspring. If the animals are hindered by a particular characteristic, the species must either adapt or face possible extinction.

Most plants and animals exist because they have successfully adapted to changes in their environment. When an organism is unable to change or deal with evolving environmental stress, it will die and the species may be threatened with extinction. Organisms able to cope with the new stress tend to survive. Over time, natural selection and evolution enhance adaptations. These adaptations to a changing environment can take varying amounts of time to occur. Some adaptations happen quickly. The immunity of insects to pesticides is one example. Other adaptations can take thousands of generations or even millions of years to occur. The loss of eyes by true cave dwellers (troglobites) is an example of a slow adaptation.



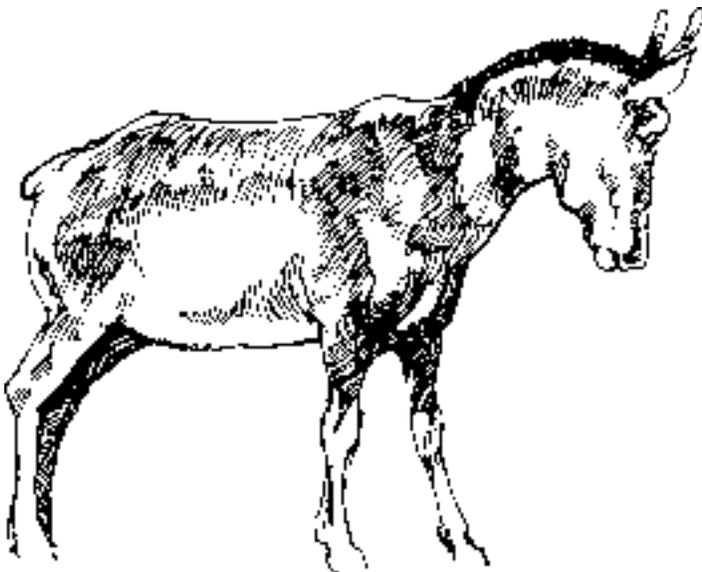
RACE FOR SURVIVAL

MATERIALS NEEDED

- One set of "Adaptation" cards
- List of "Changing Situations"
- 5" x 8" index cards or poster board
- Score card

PROCEDURE

1. Photocopy the "Adaptation" cards. Cut out the adaptations. Paste each adaptation onto a 5" x 8" index card or onto poster board that has been cut to the appropriate size. Set aside.
2. Review the list of "Changing Situations" with the students. Have students brainstorm possible adaptations for each situation. How many ways can an organism change to survive each new situation?
3. Review the list of possible adaptations to familiarize students with possible choices.
4. Place the "Adaptation" cards face up on the ground at the far end of the playing field.
5. Divide the students into teams of 5-10 students each. Each team should form a line along the edge of the playing field at the opposite end from the "Adaptation" cards.
6. Read one of the "Changing Situations".
7. On a signal, the first student in each line will race to the far end of the field and select one "Adaptation" card that will help his or her team cope with the change. Once they have selected their adaptation they should return to the starting line.
5. Once all the runners have returned, review what each team has selected. Have the students justify their selection and come to a consensus as to whether this adaptation would lead to survival.
6. Award points for correct or creative answers that can be justified. The team with the highest score will be declared the winner. Award points as follows:
 - first team to return with a reasonable choice: 3 points
 - all other teams with reasonable choices: 2 points
 - selections which would **not** lead to survival: 1 point



This activity adapted from Florissant Fossil Beds National Monument, "Adaptation Game", found in *Teaching Paleontology in the National Parks and Monuments: A Curriculum Guide for Teachers of the Fourth, Fifth and Sixth Grade Levels*

RACE FOR SURVIVAL – CHANGING SITUATIONS

Your predators become camouflaged.

Your prey becomes camouflaged.

The plants you eat become extinct.

Your predators begin to run faster.

The area where you live turns into a desert.

The plants you eat develop spines.

Humans use pesticides to kill you.

The animals you eat begin living underground.

Disease and insects kill the trees you depend on for food.

The climate becomes very cold.

The animals you eat develop armor.

Other animals learn to find and eat your eggs.

The ocean you live in dries up.

Your food supply becomes seasonal.

The animals you eat start to come out only at night.

The plants you eat develop a bad taste.

RACE FOR SURVIVAL – ADAPTATIONS

Become camouflaged.

Develop better night vision.

Hibernate.

Learn to store food.

Build your home underground.

Develop muscles and claws for digging.

Shed more fur to keep cooler.

Develop longer legs.

Develop lungs for breathing.

Sleep in the day and hunt at night.

Migrate.

Develop Armor.

Incubate eggs within your body (mammals).

Lay camouflaged eggs.

Grow quills.

Shed less fur.

Grow fangs.

Develop claws for climbing trees.

Develop a better sense of hearing.

Develop a better sense of smell.

Develop a way to store water in your body.

Become immune to pesticides.

Develop new teeth and digestive system so you can eat different plants.

Live with others of your kind and take turns keeping watch for predators.

Change your external color.

Grow faster.

Give birth to live babies.

Eat meat.

Become an omnivore so you can eat both plants and other animals.

Become warm-blooded.

RACE FOR SURVIVAL – ADAPTATION CARDS

BECOME
CAMOUFLAGED

DEVELOP BETTER
NIGHT VISION

EAT MEAT

DEVELOP MUSCLES
AND CLAWS
FOR DIGGING

RACE FOR SURVIVAL – ADAPTATION CARDS

SHED MORE FUR
TO KEEP COOLER

BECOME
WARM-BLOODED

MIGRATE

INCUBATE EGGS
WITHIN YOUR
BODY
(MAMMALS)

RACE FOR SURVIVAL – ADAPTATION CARDS

DEVELOP LUNGS
FOR BREATHING

SLEEP IN THE DAY
AND
HUNT AT NIGHT

DEVELOP
LONGER LEGS

DEVELOP ARMOR

RACE FOR SURVIVAL – ADAPTATION CARDS

DEVELOP NEW
TEETH AND
DIGESTIVE SYSTEM
SO YOU CAN EAT
DIFFERENT PLANTS

LAY
CAMOUFLAGED
EGGS

DEVELOP
A BETTER
SENSE OF
HEARING

DEVELOP CLAWS
FOR CLIMBING
TREES

RACE FOR SURVIVAL – ADAPTATION CARDS

DEVELOP
A BETTER
SENSE OF SMELL

DEVELOP
A WAY TO STORE
WATER IN YOUR
BODY

GROW QUILLS

CHANGE YOUR
EXTERNAL COLOR

RACE FOR SURVIVAL – ADAPTATION CARDS

GROW FASTER

BECOME
IMMUNE
TO PESTICIDES

GIVE BIRTH
TO LIVE BABIES

SHED LESS FUR

RACE FOR SURVIVAL – ADAPTATION CARDS

HIBERNATE

GROW FANGS

BECOME AN
OMNIVORE
SO YOU CAN EAT
BOTH PLANTS
AND
OTHER ANIMALS

BUILD YOUR
HOME
UNDERGROUND

RACE FOR SURVIVAL: ADAPTATION CARDS

LEARN TO
STORE FOOD

LIVE WITH
OTHERS OF YOUR
KIND AND TAKE
TURNS KEEPING
WATCH FOR
PREDATORS